

Aquarenova, a groundwater recharge site to restore the coastal water aquifer of Bas-Gapeau (Var, France)



Alexandre Duzan §

§ SUEZ Sondalp-Hydroforage, 16 rue de l'aqueduc, 69210 Lentilly, France - alexandre.duzan@suez.com



1 The Problem: Saltwater intrusion into groundwater

- Water needs of the city : 6 million m³/year
- Well field number: 2
- Operated aquifer: Bas-Gapeau alluvium aquifer



Figure 1 - Location of well fields | limit of the salt wedge intrusion in 2007

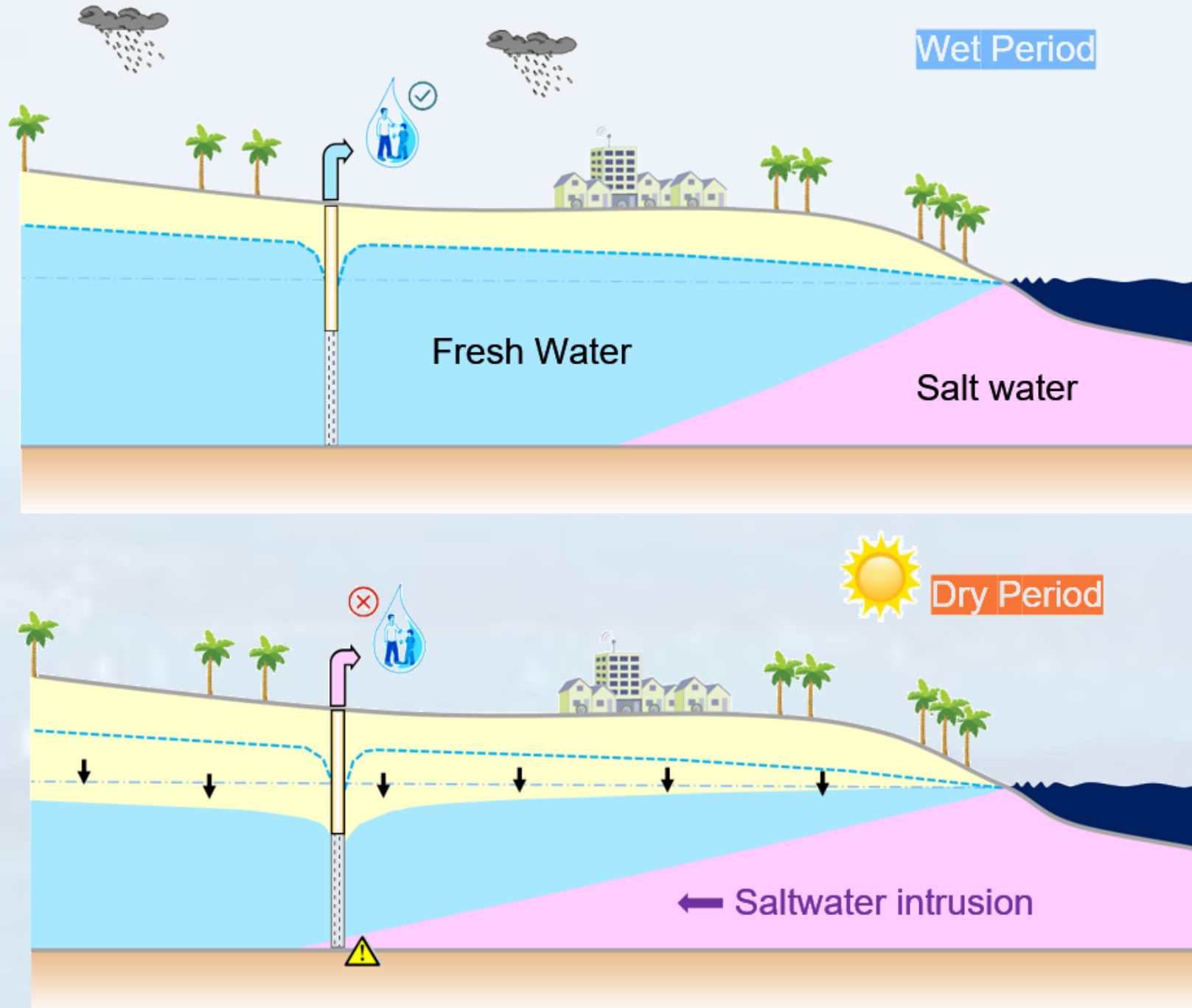


Figure 2 – Schematic section showing the salt wedge intrusion mechanism

- The alluvial aquifer of Bas-Gapeau is the main source of drinking water for the town of Hyères-Les-Palmiers in the Var.
- The overexploitation of water resources in the past (volumes withdrawn > capacity of the water table) has led to the intrusion of the salty bevel up to 2 kilometers from the coast
- The Père Eternel's well field had to be shut down for 4 years, forcing the community to purchase significant water (more than 50% of its needs).

Goals:

restore groundwater and secure water production in the context of climate change and rising sea levels

2 Aquarenova solution: groundwater recharge and control

Establishment of a groundwater recharge site

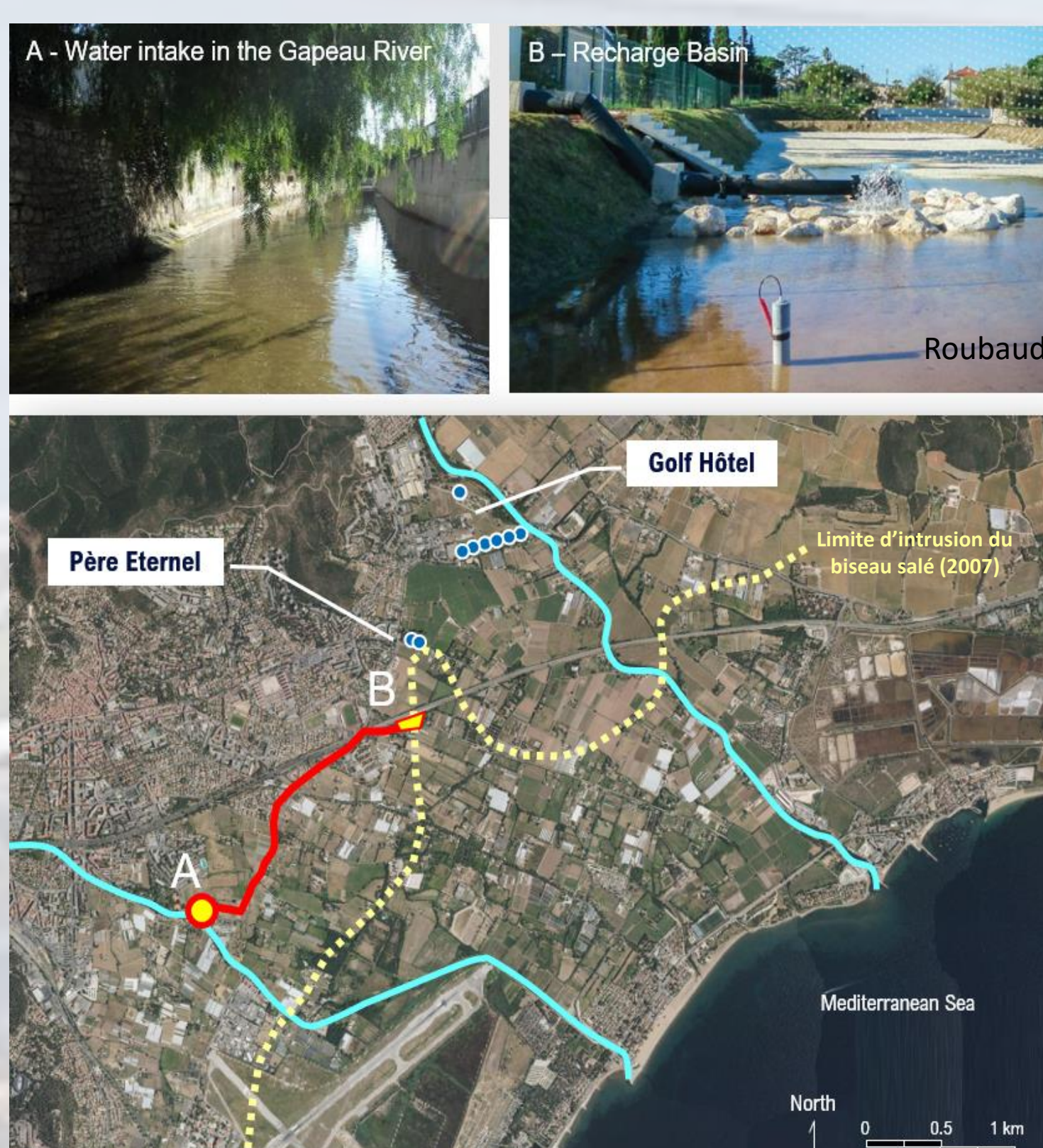
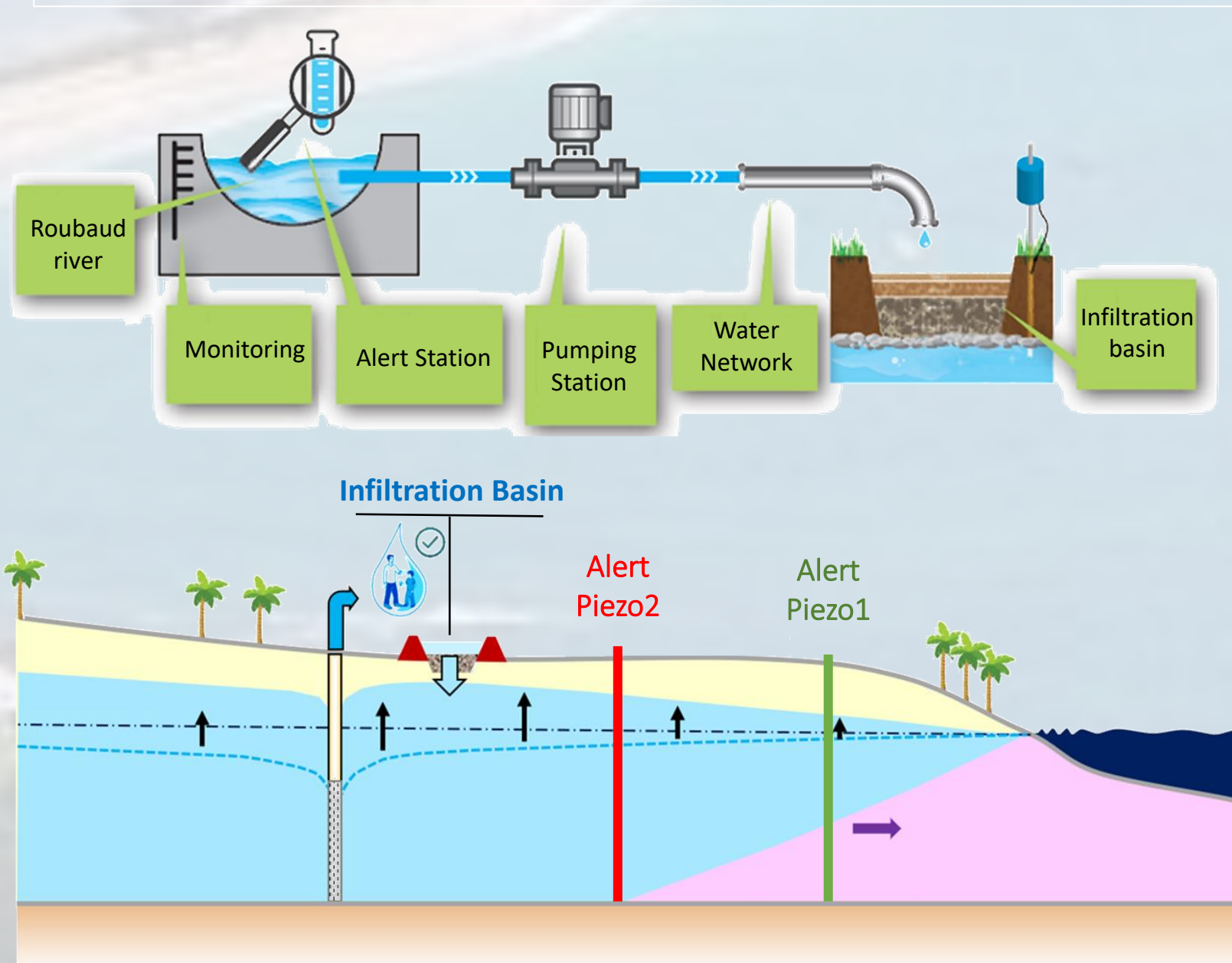
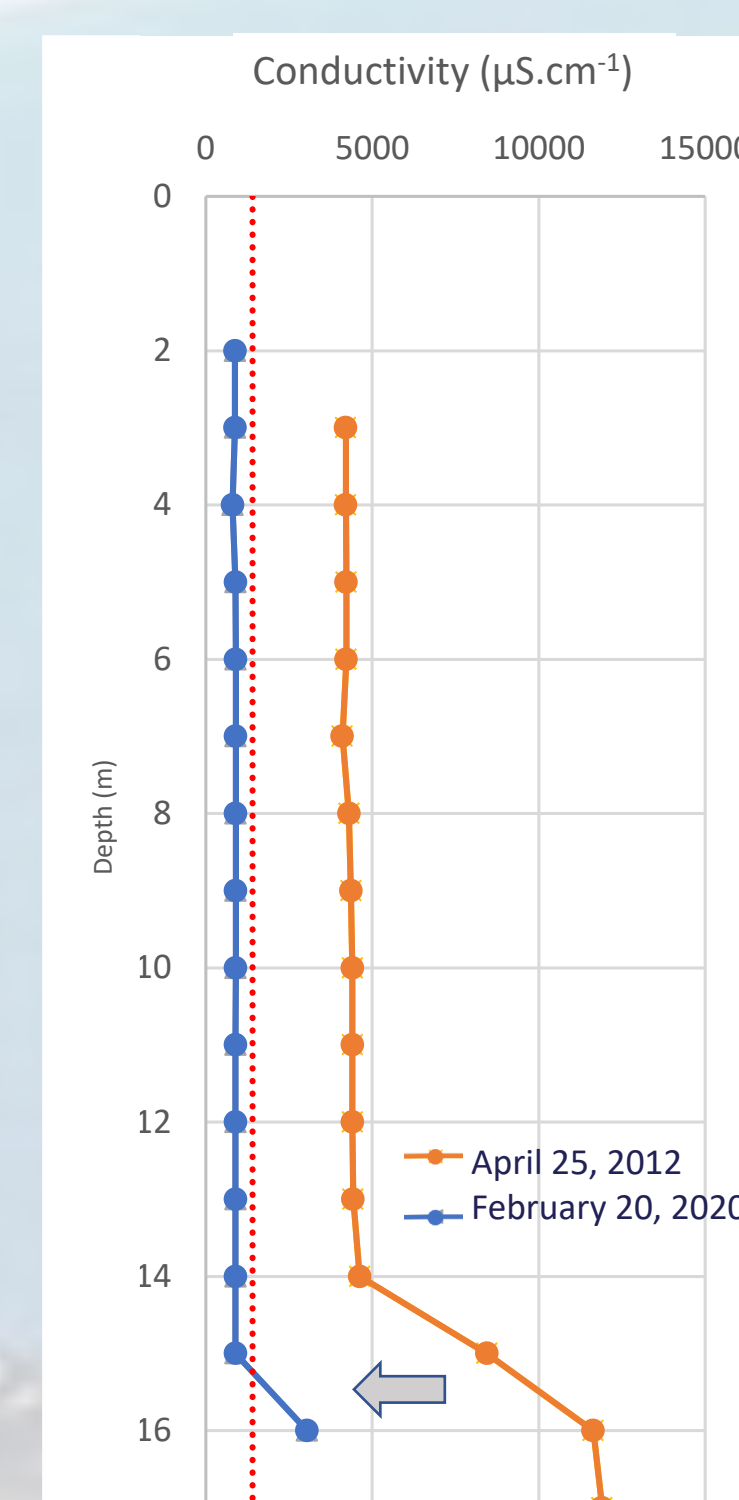


Figure 3 – Bas-Gapeau aquifer recharge site (Aquarenova)

Construction of a water intake in the Gapeau River and two basins totaling 1000 m² of infiltration area. Water infiltration during the winter period from November 1 to April 31 (installed capacity: 50 l/s – 650,000 m³/period).



Control of groundwater recharge and drinking water withdrawals with the gradient method



Real-time adaptation of recharged volumes and groundwater withdrawals according to the dynamics of the salt wedge measured in real time thanks to the monitoring of **piezometric** and **conductivity** profiles.

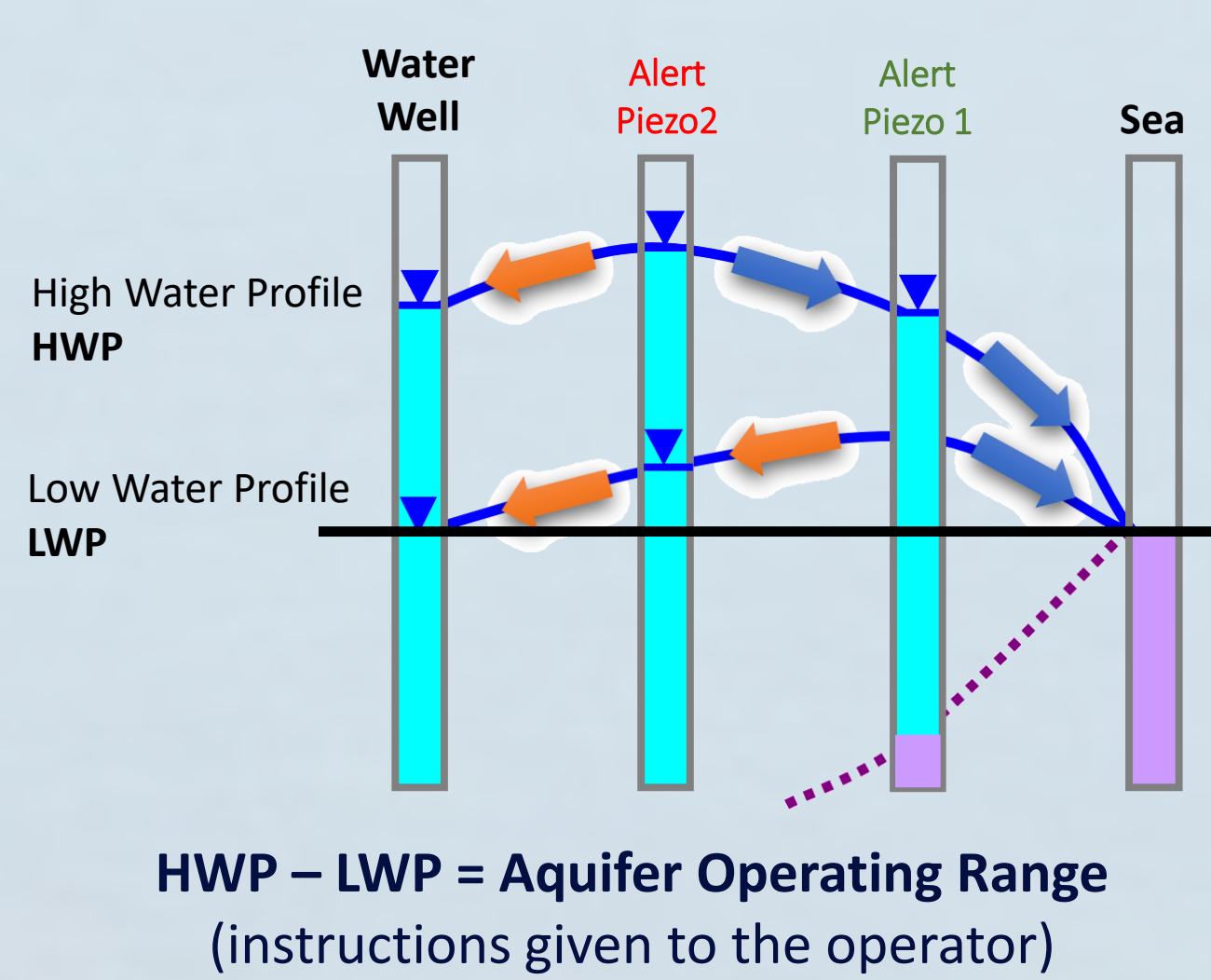


Figure 4 – Follow-up carried out and operating instructions for the gradient method

3 The results: a secure water resource

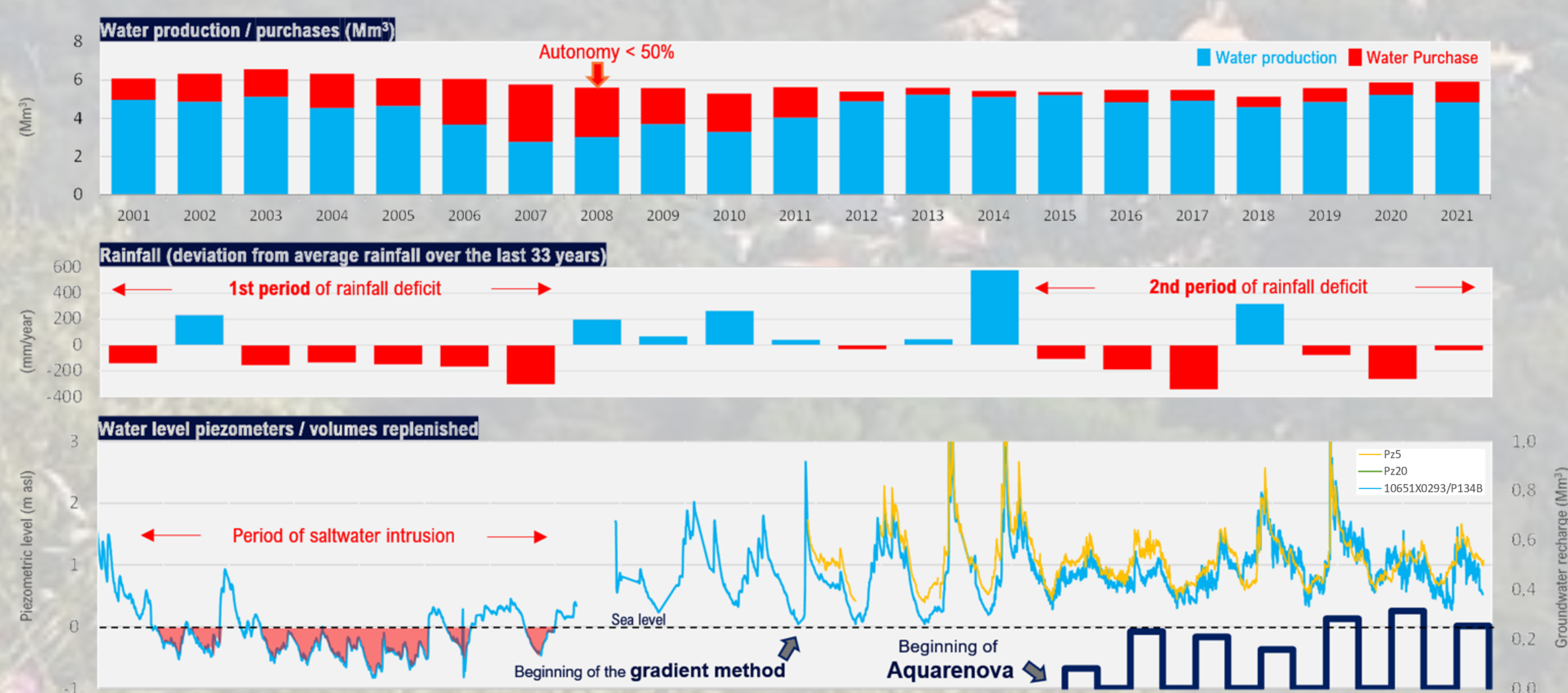


Figure 5 – Summary of Aquarenova project performance monitoring indicators

- The **Aquarenova** project has demonstrated its effectiveness, particularly during the drought episode observed between 2015 and 2017 when the water supply was not impacted.
- With Aquarenova, the **salt wedge** was maintained in its pre-intrusion position under all circumstances.
- The city has regained its **water autonomy**, allowing it to calmly consider future droughts and the future impact linked to the rise in the level of the Mediterranean Sea.

INTERNATIONAL CONFERENCE

GROUNDWATER, KEY TO THE SUSTAINABLE DEVELOPMENT GOALS

PARIS - May 18 -20, 2022

